



ADC Commercialisation Bulletin #1

VANILLA

Marketing

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Markets

Although vanilla products are traded globally, the United States, France, and Germany are the primary importers of vanilla beans. They are major re-exporters of both processed vanilla extract and repackaged fresh beans to other countries. Combined, these three importing countries probably account for 80 percent or more of imports from producing countries.

In Europe there is a retail demand for whole black vanilla pods as well as for extracts, but in the US almost all vanilla is used for the preparation of extracts. Even though most vanilla beans will eventually be processed, the buyers generally demand whole processed beans from exporters, and impose strict specifications for size and colour. One buyer from Uganda accepts chopped beans for extraction, but this is under special contract.

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Customers

Less than ten multinational companies dominate the procurement of processed vanilla beans from producing countries. McCormick and Zink & Triest, probably the two biggest vanilla traders, are already buying from Uganda through various agents. They sell whole vanilla and extracts to many secondary processors as well as in large volumes to food processors such as high quality ice cream manufacturers. McCormick in particular also produces a range of consumer products in small bottles for retailing. Lower-priced food processors will often use cheaper synthetic vanillin.

Consumers in Europe are familiar with whole beans, which they buy as well as vanilla products. There is a much smaller gourmet market in the U.S. which pays premium prices for top quality beans, including those certified as organic. These beans can often be found for sale in gourmet food stores as whole beans or in large pieces.

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Volumes

The aggregate global demand for vanilla is estimated at 2,500 Mts. to 3,000 Mts. per year, the United States continue to the leading import market for vanilla, absorbing 50-60 percent of this amount. US imports in 1998 were 1941 Mts. down from 2198 Mts. in 1997. The other major buyers of vanilla are France and Germany with imports to France totaling 364 Mts. in 1997 and imports to Germany totaling to 285 Mts. The European Union collectively imported 854 Mts. of vanilla in 1997. Approximate import levels of major world buyers are shown below excluding re-exports:

<u>Importer</u>	<u>Imports (Mts.)</u>
USA	1,500-2,000 Mts. (2,198 Mts. in 1997 and 1,941 Mts. in 1998)
Canada	150-200 Mts.

EU	700-800 Mts. (France 300-400 Mts., Germany 250-300 Mts., other EU countries import only small amounts directly as they receive most product from Germany and France)
Japan	50-80 Mts.
Switzerland	35-55 Mts.
Australia	10-20 Mts.

Current (2000) production in Uganda is estimated at 300-400 Mts. of green beans or 70 Mts. of cured beans. This is up significantly from 7 Mts. of green beans produced in 1990. At current export levels, Uganda is supplying only around one percent of world import demand. Despite increased production by other countries (most notably Indonesia), it seems certain that Uganda could increase exports to at least 100 Mts. of cured beans annually or 3 to 4 percent of current world demand.

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Prices

In the past, vanilla market prices were effectively controlled by the Madagascar-based Vanilla Alliance, a cartel which stockpiled and released vanilla beans on the world market, depending on supply and price considerations. With increased production and exports by other countries (principally Indonesia) and smuggling of vanilla out of Madagascar at below official prices, prices have dropped dramatically on the world market. The fluctuations in prices currently are mostly due to shifts in supply of vanilla beans from source countries, particularly Madagascar and Indonesia.

Since most purchases of vanilla by U.S. buyers are for extraction purposes, they tend to buy beans which are lower in quality, and therefore cheaper, than those purchased for the much smaller gourmet market. Some U.S. importers report that prices are falling faster for the extract grades of vanilla. For example, gourmet trade vanilla was being bought by one U.S. importer at \$64/kg from Madagascar in mid-1996 compared to US\$20-US\$40 per kilogram for extract grades (down from \$74/kg in 1994). The problem for producers is that the gourmet market is much smaller than the extract market.

Currently there is upward pressure on the prices of vanilla in the world market because supplies are declining. Buyers in the US reported the price of vanilla from Madagascar to be around \$ 25/kg in June 1999. One buyer expects that price to go up at least \$ 10/kg over the course of the year. Table 1 shows average FOB prices (import unit values) of US vanilla imports from major sources over the period 1995 - 1998.

Table 1: Average FOB Prices for US Imports of Fresh Vanilla from Key Suppliers, 1994-1998, US\$/kg

Supplier	1995	1996	1997	1998
Madagascar	49.92	26.47	18.11	21.45
Indonesia	29.97	26.60	20.28	14.87
Uganda		39.58	36.36	28.77
All others	49.19	38.23	25.02	25.94
Total Average price	40.07	27.43	19.26	19.27

Source: U.S. Department of Commerce

The current price for Malagasy standard grade vanilla is about \$ 40/kg, while extract grade prices in Europe remain similar to those in the US. Table 2 shows average FOB prices (import) of EU imports from major sources for selected years from 1989 - 1997. There was a significant decline in prices over those years.

Table 2: Average prices for EU Imports of fresh vanilla from Key Suppliers, selected years 1989 - 1997, ECU/kg

Supplier	1989	1991	1993	1995	1996	1997
Madagascar	63.48	61.72	54.32	35.00	23.51	18.99
Comoro	65.43	60.21	54.66	37.81	32.31	29.30
Indonesia	31.41	35.60	37.54	27.50	23.59	28.50
Other (non-EU)	31.73	37.61	27.68	17.42	18.85	13.95
Total average price	52.42	52.17	48.12	32.03	23.00	19.38

Prices for Ugandan vanilla produced during 1997 and exported during 1997/98 to both the US and Europe ranged from \$ 12 per kilogram fob for splits to \$ 30 per kilogram for high quality black vanilla pods.

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Competition

World production of cured vanilla beans averages between 2,000 and 3,000 Mts. per year, although production varies widely depending on climatic factors in the main producing countries. Madagascar used traditionally to hold large stockpiles to cater for variations between supply and demand. Madagascar is the largest producer, with 1,000 to 1,500 Mts. per year, followed by Indonesia, which has expanded its production to 700-800 Mts. from 400 Mts. in the late 1980s. The third largest producer is the Comoro, with average production of 200 Mts. per year. Smaller producers include Tonga, Reunion, French Polynesia, Mexico and Uganda.

Madagascar's Bourbon vanilla is considered the best in the world by most importers and usually receives a premium over other suppliers (excluding French Polynesia) and sets the industry standard. However, a dramatic increase in export volumes in 1997, caused by political and economic problems in Madagascar, caused a serious depression of prices worldwide. Madagascar continues to support approximately two-thirds of the world vanilla demand.

Indonesia has hit with a number of disasters in recent years. Weather, as well as political and economic problems have thwarted the Indonesian crop. Importers report that the quality of Indonesia vanilla beans has declined recently. One importer reported that he can source some Indonesian beans now that are equal to the quality of Malagasy beans, but the quantity is very limited. Some importers that traditionally buy vanilla from Indonesia are looking elsewhere, particularly Madagascar.

Buyers noted that Indonesia has had a very bad crop in 1999 and suppliers are expected to be considerably less. There is no current danger of not fulfilling aggregate global demand because there are considerable reserves, particularly in Madagascar. If production continues to be low in 2000 therefore buyers may have reason to worry. There is general consensus that the world vanilla import market has room for new suppliers, who can produce beans of superior quality and provide consistent quantities.

French Polynesia is the only producer of vanilla tahitensis, noted for declining production and escalating prices. It is used mostly in perfumes, it does not compete directly with vanilla for the culinary market.

Table 3: US Imports of Fresh Vanilla, 1995-98 in Mts.

	1995	1996	1997	1998
Madagascar	650	787	1443	1062
Indonesia	727	621	608	752
Uganda	0	16	17	54
Comoro	40	72	82	23
Tonga	46	14	5	23
China	0	0	1	20
French Polynesia	7	4	4	2
Costa Rica	5	4	1	2
Mexico	6	6	19	2
Other	0	0	18	1
Total	1481	1524	2198	1941

Source: US Dept. of Commerce

Table 4: Total EU Imports of Vanilla from Non-EU Suppliers (Mts., 1988-1997)

	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Madagascar	255	175	213	169	228	259	405	487	485	577
Comoro	59	89	73	105	103	125	57	58	45	86
Indonesia	26	103	89	108	106	61	36	36	54	28
Uruguay	0	0	0	0	0	0	0	0	11	23
Jamaica	0	7	3	0	0	0	0	0	2	10
French Polynesia	1	2	3	2	3	5	5	5	2	6
Mauritius	0	0	0	0	0	3	0	0	0	5
Mayotte	5	5	4	9	13	3	5	2	2	3
Other*	30	31	35	35	76	76	90	104	152	116
Total Non-EU Imports	376	412	420	428	529	532	598	692	753	854

Source: Eurostat

* includes imports of vanilla from re-exported non-producers (mostly USA, Canada, and Singapore) as well as imports from minor producers

Production

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Production Method

Vanilla is a climbing vine of the orchid family which grows naturally on forest trees. It produces green vanilla pods under favorable conditions.

In Uganda, vanilla is often interplanted with other crops such as coffee and bananas. It requires light shade (two-thirds to one-half of normal sunshine), a support to grow on (e.g. tree such as Kilowa or Glyricidia), high rainfall (more than 1,250 mm/year), and high humidity. While vanilla cannot grow well in dry areas, it does require a short dry season (2 to 4 months) to stimulate flowering. Where there is more than one dry season (such as in Mukono),

two flowerings will occur. In recent years vanilla production has expanded to new areas in Bundibugyo, Mbale, Iganga, Jinja, Masaka, Mpigi, Kiboga, Mubende and Kabarole.

Propagation: Commercial propagation is done with stem cuttings from healthy plants. Cuttings are typically 120-200 cm long with at least 12 nodes. The vine cuttings should be hung in a well-ventilated area and under shade for a period of one week to stress the plant to produce roots at a quicker pace after planting.

Planting Directly: Planting should be done at the beginning of a wet season. Plant 2.5-3.0 meters between rows and 2.0-2.5 metres apart within rows (about 1,500 plants/ha). This spacing can be increased as required depending on the type of intercropping carried out. Prepare the plant by cultivating the soil, weeding, and composting. Remove 3 or 4 of the leaves from the bottom end of the vine and place this portion of the vine horizontally in a shallow trench (5-10 cm) at the base of the support tree. The top of the vine should be tied loosely to the support and the bottom of the vine in the trench should be covered with soil with the cut bottom end sticking out. Place mulch around the vine, remember to use dry materials.

Nursery Production: For nursery production, plant cuttings (trim the 1 m long vines into pieces three nodes long) in a pot or bag containing compost (blend of 30% soil, 30% manure and 40% of either coffee husks, gritty sand, chipped bark, or crushed charcoal). The pot or bag should have drainage holes. The cutting should be planted in the compost where the center node is at soil level. Water the cutting daily. The nursery should have sides and roof covered with palm fronds, grass or other locally available material to shade the plants to about 50-75% and to keep down winds which would remove humidity. Within 60 days begin removing the shading material slowly to have the plant grow accustomed to natural growing conditions. After 3-4 months, transplant the plant to the field. This system is used by new growers with limited or no vines but in Uganda there are a lot of vines for planting.

Looping: To control the length of the vines and encourage healthy root systems, loop the vines during the wet season. Take a long mature vanilla vine downward through the mulch, then back up to the support, making sure to remove the leaves going through the mulch.

Flowering and Pollinating: Flowering is stimulated naturally by the dry season, but also can be encouraged by selected vine cutting and by the removal of the apical buds. Growers should also reduce the shade level to 1/3 to further encourage flowering. After flowering (usually 2-3 months after stimulation), growers will need to hand-pollinate the flowers. This should be done early in the morning following rain, if possible, and 12 to 18 hours after flowering. Producers use split bamboo, safety pins, or other small, thin objects to pollinate vanilla. After beans begin growing, remove small/bent beans and select out remaining beans to leave roughly 10-12 bunches of beans per plant with 8-12 beans per bunch.

Harvesting: Harvest vanilla 8 to 9 months after pollination or when the blossom end of the green pods starts turning from green to yellow. When a bean has a uniform green color, it is too immature to be picked. If the tip of the bean turns black and the bean splits open, it is over-ripe for the traditional drying method. Harvesting usually lasts two months and beans should be picked every day or every other day during this time. After harvesting, remove the vine which hangs down from the branch and discard it. While this cutting can be used for propagation of new plants, there is reportedly a low success rate for rooting of these cuttings.

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Processing

Mature green vanilla beans have a high moisture content and no distinctive aroma. In order to convert the raw beans into highly aromatic, dark brown vanilla beans required for export, it is necessary to carry out a specific post-harvest process which reduces moisture content to 22-30%, depending on buyers' specifications, and promotes the chemical changes in the beans responsible for vanillin production and colour changes. Since this process requires skill, experience and specialized facilities, it is normally carried out by specialist processors who purchase green beans from the growers. Small-scale growers cannot carry out on-farm processing satisfactorily since there would be unacceptable variation in the quality of vanilla produced by different growers.

Beans can be processed or cured either through a traditional method or through a much quicker process called rapid curing. For traditional curing, dip the whole bean in 65°C water for about 3 minutes. Wrap the beans in blankets for two to three days and allow them to sweat. Remove the beans daily from a store room and dry the beans on trays in the sun for 1 to 2 hours, depending on the intensity of sun. While in the store room, the beans should be wrapped in woolen blankets and kept in wooden boxes. This should be continued until a moisture level of approximately 30 percent is attained (2 to 3 months). Experienced processors can gauge the moisture content by handling the beans. For a more accurate determination, use a moisture meter.

Rapid curing takes 2 to 3 weeks, depending on how the beans are dried. Typically, rapid curing involves chopping beans into 1-2 cm pieces, immersing them in hot water, letting them sweat for 48 to 72 hours, and then placing them on a tray and into drying ovens maintained at a constant temperature and humidity.

After any type of curing, the beans must be conditioned for 3 months by placing them in hermetically sealed containers. Prior to export, the moisture level should be reduced 22- 28 percent.

Due to lower labor costs, it is probably more cost-effective in Uganda to use the traditional curing method. More importantly, the majority of overseas buyers only want traditionally cured beans. Since they also want consistency of quality, buyers also prefer to buy from specialized processors, who handle curing for a large number of farmers.

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Varieties

Vanilla planifolia is the only commercial species utilized for production of food grade vanillin products. It has only one main cultivar, which is the type currently being grown in Uganda and is widely available.

9

Yield

A vanilla plant will yield commercial beans for 5 to 6 years if well-managed. A mature plant of 3 to 4 years can produce 80-100 beans per year. This means, for a pure stand, it is possible to obtain yields of 3,000 kg per hectare of green beans. This should yield 500 to 600 kilograms of cured beans, depending on the quality of the green bean, whether the bean was picked at the correct maturity, and whether correct curing procedures were followed. In fertile, well-managed fields (with plants having more than seven vines) it is possible to increase yields by forcing up to three vines per plant to produce beans. There are 40-50 good quality (15-20cm) green beans per kilo.

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Time to First Harvest/Seasonality

The time from planting to first harvest is typically 2 to 3 years. Because there are two dry seasons in Ugandan growing regions, two harvest seasons are possible (see Table 4).

Table 4: Illustrative Time Line for Vanilla Growing in Uganda

	<u>Minor Season</u>	<u>Major Season</u>
Flowering/Pollination	May-June	Jan - Feb
Harvesting	January-February	June-July
Curing (Traditional)	February-March	July-August
Conditioning	March-April	August-September
Export	May onwards	October onwards

If plants flower in January-February, the farmer may select to pollinate for a crop in September-October. However, this will affect the yield of the crop in the major season. Alternatively, the farmer can select to ignore any flowering in January-February and simply pollinate during the August-September crop for an optimal May-June harvest period.

The most important thing is to let the beans mature for at least 8 months before harvesting (until the blossom end starts turning yellow) to obtain the best quality beans but do not let beans split when still in the field. In well-managed, fertile fields, it is possible to obtain two good yields per year.

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Pests and Disease Prevention

Pest and disease problems are often caused by poor management practices. Plants should be spaced sufficiently to allow for proper ventilation. The right amount of shade should be provided, not too little which will cause sunburn, nor too much which will reduce air circulation. The root systems should be managed carefully by looping and providing mulch. If diseases or viruses are found on a plant, the plant should be removed from the field and destroyed.

Fusarium root rot is the most serious disease affecting vanilla. Infected plants and surrounding soil should be removed from the field. Wait one season before planting in the location of the affected plant and ensure that there is good drainage. The practice of heaping soil over the roots leads to the wilting of the plant, this is sometimes referred to as disease. While applications of copper fungicide drenches to the soil can both prevent and control this disease, good management practices are more effective and environmentally friendly.

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Fertilizer Requirements

Mulch three times per year with compost or dry materials which will slowly breakdown to provide the plant nutrients and to keep the soil light and moist. Any plant material, including coffee husks, can be used. Since root systems are very shallow, inorganic fertilizers should only be used in very dilute form. Buyers prefer vanilla which has been produced using organic fertilizers.

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Water Requirements

Vanilla should be grown in areas with at least 1,250 mm of rainfall per year. A dry period will be required to induce flowering. Nursery plants will require daily watering.

14 Product Specifications

Production and traditional processing methods of the type used in Uganda produce Bourbon-type vanilla.

Grading standards differ among producing countries. Classifications are based on bean length, aroma, colour, moisture content, consistency and freedom from blemishes, insect infestations and mildew. Beans are categorized as unsplit, split or cuts. Top class beans are dark and oily, with a good strong flavor and aroma and no defects. Bourbon vanilla is classified by Madagascar into five main grades of whole and split beans -- 1st, 2nd, 3rd, 4th, and an additional grade for all other beans (see Table 5).

Table 5: Classes for Vanilla in Madagascar

1st	Good flavor, length greater than 14 cm, supple, full, no spots, no scratches, tannish-brown uniform color, moisture content less than 25 percent
2nd	Good flavor, length greater than 14 cm, supple, some spots and scratches, moisture content 25-28 percent
3rd	Good flavor, length greater than 14 cm, supple, some dry spots and scratches, red blemishes, moisture content more than 30 percent
4th	Broken or cut, length less than 14 cm, red blemishes, moisture content more than 30 percent

A minimum vanillin content of 2 percent and a moisture content in the area of 20 to 22 percent are preferred by most importers.

15 Packaging

For most world trade, the grades of whole and split beans are subdivided according to size (length) and then put into bundles, each containing 70-100 beans and weighing between 150 and 200 grams. The bundles are packed into waxed-paper-lined tin boxes, which hold between 20 and 40 bundles. The tins have traditionally been packed into wooden boxes, each holding six tins. More recently, cardboard boxes have been used.

Investment

Cost of Production

Table 6 provides estimates for costs of production on a one-hectare Ugandan farm.

Table 6: Ugandan Vanilla Farm Production Costs (Ushs/ha, 1994)

<u>Activity</u>	<u>Cost (Ushs/ha)</u>
A. Inputs	
Vanilla Cuttings (1,500 cuttings @ Ushs 300/cutting, depreciated over 5 years)	90,000
Support Trees	150,000
Mulch	200,000
Miscellaneous	200,000
Subtotal Inputs	640,000
B. Labor (4 people @ Ushs 1000/day x 250 days/year each)	1,360,000
TOTAL COSTS	2,000,000
Yield Green Beans (kg/ha)	3,000
Producer Price (Ushs/kg)	2,500
REVENUE	7,500,000
GROSS MARGIN (Ushs/ha)	5,500,000

For this example, as farm gate prices dropped, the farmer's gross margin drops to the levels in Table 7.

Table 7: Gross Margin of 1-ha Ugandan Vanilla Farm at Varying Farm Gate Prices (based on data from table 6)

	Farm Gate Price (Ushs/kg green bean weight equivalent)				
	1,000	2,000	2,500	3,000	3,500
Gross Margin (Ushs/ha)	500,000	3,000,000	5,500,000	7,000,000	8,500,000

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Profitability

Assuming a green/dry ratio of 6:1 and postharvest costs of Ushs 5,000/kg of cured bean, Table 8 shows an estimated gross margin for a processor/exporter.

Table 8: Gross Margin Calculations for Processor/Exporter of Cured Vanilla (Ushs/kg)

CIF (US\$/kg)	Raw Material Cost (Ushs/kg green bean weight equivalent)				
	1,000	2,000	3,000	4,000	5,000
20	17,000	11,000	5,000	(1,000)	(7,000)
25	24,000	18,000	12,000	6,000	0
30	31,000	25,000	19,000	13,000	7,000
35	38,000	32,000	26,000	20,000	14,000
40	45,000	39,000	33,000	27,000	21,000
45	52,000	46,000	40,000	34,000	28,000
50	59,000	53,000	47,000	41,000	35,000

1US\$= Ushs 1400

18**Investment Requirements**

Investment requirements for planting one hectare of vanilla are shown in Table 9 below. Because of the high labor requirement during pollination periods, vanilla is usually grown more successfully by smallholders with 100-1,000 plants than on a plantation basis. Start-up planting material is usually obtained from a neighbor. Subsequent plantings can be made from cuttings of the farmer's existing crop. If plantings are inter-cropped with tree crops, the latter can be used as supports for the vanilla vines. If vanilla production is the sole crop, a shade and trellis system will be required. Nursery propagation will require a simple shade structure and either pots or bags.

Table 9: Cost of Establishing 1 Hectare of Vanilla to First Harvest (2.5 years, Ushs)

Planting material	450,000
Support trees	150,000
Mulch	200,000
Labor	1,360,000
Miscellaneous	200,000
Total Ushs	2,360,000

For curing using the traditional method, the processor will require a structure to store the beans, large metal bins or saucepans (for hot water immersion), drying trays, and woolen blankets. See Table 10. Rapid curing will require investment in drying ovens and forced-air systems.

Table 10: Cost of Establishing a Traditional Processing Plant for 50 tonnes of Fresh Vanilla Beans (Ushs)

Storage building - 20m x 20m	20,000,000
Heating pans	450,000
Storage boxes - 30 @ 100,000	3,000,000
Blankets - 1000 @ 15,000	15,000,000
Drying racks	3,000,000
Miscellaneous	1,000,000
Total	42,450,000

More Information

Additional information on vanilla production, postharvest handling, and marketing are available from ADC.

ADC Commercialization Bulletins are published by the Agribusiness Development Centre of the USAID-funded Uganda's Investment in Developing Export Agriculture (IDEA) Project. The bulletins provide potential investors with a quick reference to production and market characteristics for various nontraditional export crops. For additional technical details, contact:

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